Department of Labor and Industries

ELECTRICAL CURRENTS

Code guidance from the Department of Labor and Industries
Office of the Chief Electrical Inspector

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Electrical code issues and answers.

● Contractor, electrician, and trainee compliance

To maintain a level playing field in the electrical construction industry, our electrical inspectors work hard at ensuring a licensed electrical contractor is performing the electrical work on the construction site in compliance with state law. When a licensing compliance check is performed, several questions are asked. Is the electrical equipment installed by a licensed electrical contractor within the scope of their license? Are the electricians and trainees on site properly certified and/or supervised?

There is another aspect of compliance that is not as immediately obvious. If the licensed electrical contractor is not working directly for the property owner, then the electrical contractor must be working for an appropriately registered (RCW 18.27) Washington construction contractor.

The electrical program has become aware of a compliance problem with out-of-state contractors unlawfully installing or subcontracting electrical work in Washington. Our electrical installation laws require that any contractor performing electrical work within the state must be a Washington licensed electrical contractor. For any construction contractor to subcontract the installation of the electrical work, the construction contractor would need to be a registered (RCW 18.27) general or specialty contractor in Washington.

Our electrical inspectors ensure the proper electrical licensing and certification on a job site and will make a referral to the compliance inspectors for unregistered (RCW 18.27) construction contractors.

● Are you still working within the scope of your electrical contractor specialty license?

As your business grows it may be necessary to move up to a general electrical contractor license or add another specialty to your specialty license. A "combination" specialty electrical contractor license requires a designated administrator in each specialty. However, only one contractor license fee and bond is required for any number of combined electrical specialties. RCW 19.28.120(1)(h) states that *"A specialty electrical contractor license shall grant the holder a limited right to engage in, conduct, or carry on the business of installing or maintaining wires or equipment to carry electrical current, and installing or maintaining equipment; or installing or maintaining material to fasten or insulate such wires or equipment to be operated by electric current in the state of Washington as expressly allowed by the license."*

This also means that a specialty electrical contractor cannot accept work outside of their specialty and then subcontract the work to an appropriately licensed electrical contractor. A specialty electrical contractor may perform work and accept subcontract work only within their specialty, unless they are also registered (RCW 18.27) as a construction contractor.

● Amusement ride season inspection reminders

Amusement ride companies are required to have each amusement ride or structure inspected for mechanical safety at least once annually by an insurer or a person with whom the insurer has contracted. Each ride or structure must also have an annual electrical inspection performed by the Department of Labor and Industries. Additionally, the electrical inspector shall monitor at each location where an amusement ride or structure is set up for operation, that the operating permit (safety) decal and a carnival electrical inspection decal have been obtained and that the ride description, model number and serial number are properly identified.

Prior to each electrical inspection the inspector will contact Valerie Valencia at (360) 902-6278 and obtain a list of the current rides registered with the department. If there are any changes or additions to this list of rides they should be noted. The inspector will, after completing each electrical inspection fax a copy of the list along with any correction reports to Ms. Valencia at FAX (360) 902-5296.

Upon completion of the first electrical inspection of the season for each ride or structure the electrical inspector will place a carnival (annual) electrical inspection decal at the ride or structure disconnecting means. An annual electrical inspection decal will also be placed at each distribution panel, concession panel, spider or splitter box, and at each generator to indicate that the initial annual inspection was made for that calendar year.

For the rest of the season, the electrical inspector will inspect the electrical power generation and distribution system for compliance with the National Electrical Code each time the ride or structure is set up for operation. A standard approval sticker will be posted at each generator or other power source upon completion of each site set-up.

A certificate of insurance indicating **$1,000,000 worth of liability insurance listing the Department of Labor and Industries** as the certificate holder is required to get an operating permit (safety) decal for any amusement ride.

● Paralleling conductors with ampacities allowed in Note 3 to table NEC 310-16 (Table 310-15(b)(6) in the 1999 NEC)

The NEC will allow conductors for total dwelling units loads to be utilized at ampacities greater than the values shown in Table 310-16 when all of the following conditions are met:

1. The conductors supply a 120/240-volt, 3-wire, single-phase dwelling service entrance, service lateral, or main power feeder.
2. The conductors are type RH, RHH, RHW, THHW, THW, THWN, THHN, XHHW, and USE (The 1999 NEC adds RHW-2, THW-2, THWN-2, XHHW-2, SE, and USE-2 to the list) installed in raceway or cable.
3. The grounded conductor is permitted to be smaller, than the ungrounded conductors, provided the requirements of sections 215-2, 220-22, and 230-42 are met.

Can conductors be used in parallel at these greater ampacities? Can the greater ampacities be applied to two-family and multifamily dwelling service conductors? The code does not clearly address these questions. Department inspectors and headquarters personnel have given various interpretations and decisions over the years. Even industry "experts" have differing opinions.

Consider the following example (based on the 1999 NEC article identification numbers):
Table 310-15(b)(6) will allow 2/0 THW copper conductors to supply a dwelling unit total calculated load of 200 amps and allow 400 kcmil THW copper conductors for a calculated load of 400 amps. Table 310-16 ampacities for 2/0 THW copper and 400 kcmil THW copper are 175 amps and 335 amps respectively. Clearly, two parallel runs of 2/0 THW copper have an ampacity of 350 amps which exceeds the rating of the single run of 400 kcmil THW copper permitted to supply a calculated 400 amp dwelling unit load. Similar situations exist for the other wire combinations within the table.

Department electrical plan review experience with 12-month metered demand data for structures wired as multifamily dwelling units shows a comfortable margin of safety between calculated loads and actual metered peak demands on the electrical system. The inclusion of 1996 NEC Note 3 to Table 310-16 and 1999 NEC Table 310-15(b)(6) in the Code, as exceptions to the ampacity limitations of Table 310-16, is based on the large diversity of electrical loading found in dwelling unit occupancies.

Regardless of previous interpretations or decisions made by the department, the increased ampacity of Table 310-15(b)(6) will be allowed for one-, two-, and multifamily dwelling units that meet all of the requirements of 1999 NEC article 310-15(b)(6). Conductors utilized at the ampacity in Table 310-15(b)(6) will be permitted to be used in parallel at that ampacity in not more than two paralleled runs in separate conduits on dwelling unit services rated up to 400 amps, 120/240 volt, 3-wire, single-phase only. Such paralleled conductors must comply with all of the provisions of NEC 310-4.

● 1999 National Electrical Code changes

Another reminder that the 1999 NEC will be effective on March 15, 1999. Our inspectors will allow a transition period of approximately 90 days (till June 30, 1999) when <u>either</u> the 1996 or the 1999 code (not a mixture) can be applied to an electrical installation.

Many exceptions have been written into positive language, language was modified to better express the intent of the code panels, and some articles have been radically reorganized or renumbered. Most of the technical changes are less rigid than the requirements of the articles in previous editions.

We feel that 1999 NEC 225-30 (formerly covered by 1996 NEC 225-8) deserves special attention because the economic consequences of missing this change will be severe. The issue is complicated by the fact that the new requirements of this article used to be included in our WAC rules from April 1993 till September 1997.

1999 NEC 225-30 states *"Where more than one building or other structure is on the same property and under single management, each building or other structure served <u>shall be supplied by one feeder or branch circuit</u> unless permitted in (a) through (e). For the purpose of this section, a multiwire branch circuit shall be considered a single circuit."* Sections (a) through (e) describe special conditions, occupancies, requirements, characteristics, and procedures that can possibly allow additional branch circuits or feeders. Your electrical system designs for such buildings should include adequate capacity so future loads will be able to remain in compliance with this article.